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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,381	10/16/2003	Robert Lee Barcus	9388	2125

27752 7590 11/29/2005

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EXAMINER

CORDRAY, DENNIS R

ART UNIT	PAPER NUMBER
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1731

DATE MAILED: 11/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/687,381

Applicant(s)

BARCUS ET AL.

Examiner

Dennis Cordray

Art Unit

1731

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 7 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The aliphatic group R₂ is defined in claim 6 as having from 2-4 carbon atoms, whereas some of the species listed in claim 7 have corresponding aliphatic groups with more than 4 carbon atoms, thus the species broaden rather than limit claim 6. For example, sorbitol contains 6 carbon atoms, 3-methyl butanol has 5 carbons, and 3,3-dimethyl butanol has 6 carbons.

Claim Rejections - 35 USC § 102

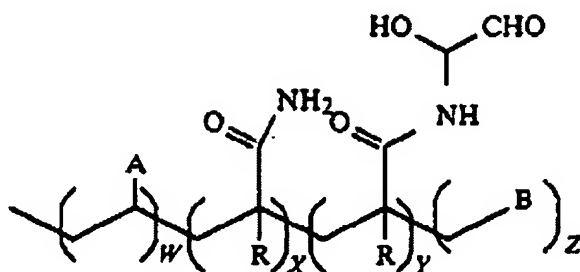
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 6, 8, 10-13, and 15-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Bjorkquist et al (4603176).

Claims 1, 2, 4 and 6: Bjorkquist et al discloses a wet strength resin with the following structure (abstract)



wherein A is a polar, non-nucleophilic unit; B is a hydrophilic, cationic unit; each R is H, C₁-C₄ alkyl or halogen; and W, X, Y and Z represent the mole percents of their respective monomeric units. The ranges are as follows:

W - about 5 to about 95 mole %

X - about 3 to about 65 mole %

Y - about 1 to about 20 mole %

Z - about 1 to about 10 mole %

In the above structure, if R = H, CH₃, or a halogen, then sidegroup A corresponds to sidegroup W in the instant invention; sidegroup B corresponds to sidegroup Q in the

instant invention; and the sidegroup $\text{—}\overset{\text{O}}{\parallel}\text{C}\text{—NH—CH}\begin{matrix} \text{OH} \\ \text{CHO} \end{matrix}$ corresponds to both

sidegroups A and Z in the instant invention (when, in claim 2, X = NH and, R₁ = CHOH, R₂ = CHCHO). Subscripts W and Z in the above structure correspond to subscripts b and d in the instant invention respectively. Subscript Y in the above structure corresponds to subscripts a and c in the instant invention.

The composition range defined by W, Y and Z in the above structure significantly overlaps and thus anticipates the claimed range.

Claim 3: Bjorkquist et al discloses that the temporary wet strength resin has a molecular weight between about 5,000 and 200,000, which significantly overlaps the claimed molecular weight (abstract).

Claim 8: Bjorkquist et al discloses examples where the non-nucleophilic monomer unit is N-vinyl pyrrolidone or N,N-dimethyl acrylamide (col 10, lines 17-18, Example I and col 11, line 29, Example IV).

Claims 10-12: Bjorkquist et al discloses examples of fibrous structures comprising the claimed temporary wet strength resin described above (cols 11-15, Examples IV-VII). Bjorkquist et al further discloses that the wet strength resin can be added in an amount from about 0.005% to about 2% of the weight of the fibers (col 9, lines 66-68; col 10, line 1).

Claim 13, 15 and 16: Bjorkquist et al discloses a process for making a three-layered tissue paper comprising a) providing a fiber furnish, b) forming an embryonic web on a wire, c) drying the embryonic web, and d) adding the temporary wet strength resin as described above to the furnish. Bjorkquist et al also discloses a tissue paper made using the temporary wet strength resin sheet (col 15, lines 24-68, Example VIII).

Claim 17: Bjorkquist et al discloses a method for making the temporary wet strength resin comprising providing monomeric units as described above and polymerizing them (col 5, line 68 and col 6, lines 1-35).

Claim 18: Bjorkquist et al discloses several examples of fibrous structures comprising the temporary wet strength resin described above that have the Wet Tensile

Art Unit: 1731

Loss properties and wet tensile strength/dry tensile strength ratio claimed (cols 13-15, Examples V-VII).

Claims 19 and 20: Bjorquist et al discloses a polymer that comprises cationic, co-crosslinking and homo-crosslinking functionality and that hemiacetal (unstable) bonds are formed between hydroxyl groups of cellulose and aldehyde functionality of the polymer (col 4, lines 26-50). The instant specification gives an example of an unstable bond on page 4 as "a hemi-acetal bond formed by reacting a hydroxyl moiety with an aldehyde moiety."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bjorkquist et al (4603176) in view of Bjorkquist (4981557).

Bjorkquist et al ('176) discloses that the rate of tensile decay is increased if the relative proportion of amidol (homo-crosslinking) to hemiacetal (co-crosslinking) bonds is decreased. Bjorkquist et al also discloses that the hemiacetal bonds result from the reaction of the cellulose hydroxyl groups with the aldehyde functionality of the resin polymer (col 4, lines 26-46). Bjorkquist et al does not disclose adding a monomer unit with only aldehyde functionality.

Bjorkquist ('557) discloses a temporary wet strength resin made from monomers containing only aldehyde functionality (similar to group A of the instant invention) and no hydroxyl functionality, as well as non-nucleophilic and cationic monomers (abstract). Bjorkquist also discloses suitable monomers as including acrolein, methacrolein, 3,3-dimethoxypropyl acrylamide, 3,3 diethoxypropyl acrylamide, 3,3-dimethoxypropyl methacrylamide, 2,2 dimethoxy- 1 -methylethyl acrylate, 5-(acryloylamino)pentanal dimethylacetal, 8-(acryloylamino)octanal dimethylacetal, 3-(N-acryloyl-N-methylamino)propanal dimethylacetal, 3,3-dimethoxypropyl methacrylate, and 2-(acryloylamino)ethanal dimethylacetal (col 6, lines 16-26).

The art of Bjorkquist et al ('176), Bjorkquist ('557) and the instant invention are analogous as they pertain to the art of making water dispersable resins. It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate the monomers of Bjorkquist ('557) having only aldehyde functionality into the resin of Bjorkquist et al ('176) in view of Bjorkquist ('557) in order to increase the rate of tensile decay of a tissue product incorporating the resin.

4. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bjorkquist et al (4603176) in view of Steinwand (5039764).

Bjorkquist et al ('176) does not disclose a surgical garment made using the temporary wet strength resin.

Steinwand teaches that wet strength resins are used in nonwoven disposable items such as surgical packs and gowns because they impart high strength to the products (col 1, lines 17-24).

The art of Bjorkquist et al, Steinwand and the instant invention are analogous because they pertain to the art of making and using wet strength resins. It would have been obvious to one having ordinary skill in the art at the time of the invention to make surgical garments incorporating the wet strength resin of Bjorkquist et al ('176) in view of Steinwand ('557) in order to increase the strength of the garments.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bjorkquist et al (4603176) in view of Kekish et al (3317370).

Bjorkquist et al ('176) does not disclose the use of separate aldehyde containing and hydroxyl containing sidegroups.

Kekish et al discloses a wet strength resin having separate aldehyde containing and hydroxyl containing sidegroups (col 3, lines 60-66 and col 6, lines 28-29, 43-49).

The art of Bjorkquist et al, Kekish et al and the instant invention are analogous because they pertain to the art of making and using wet strength resins. It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate separate aldehyde containing and hydroxyl containing monomers into the wet strength resin of Bjorkquist et al in view of Kekish et al as old and well known art.

Response to Arguments

6. Applicant's arguments filed 31 October, 2005 have been fully considered but they are not persuasive. The reasons are as follows:

Claim Objections

Claim 7 still lists species that have aliphatic groups with more than 4 carbon atoms corresponding to the group R_2 defined in claim 6 as having from 2-4 carbon atoms. Thus the species broaden rather than limit claim 6. Examples of the offending species have been added to the Objection.

Rejection Under 35 USC §102(b) Over U.S. Patent No. 4,603,176

Applicants argue that the '176 Patent does not teach a temporary wet strength resin comprising a polymer backbone comprising a co-crosslinking monomeric unit that is separate from a homo-crosslinking monomeric unit comprising a hydroxyl moiety, in combination with a cationic monomeric unit as claimed in Claims 1, 10, 15, 17 and 18, as amended.

The polymer disclosed in the '176 Patent as a wet strength agent comprises:

- a cationic monomeric unit and
- a unit that is both co-crosslinking and homo-crosslinking, has a hydroxyl moiety, and fits the claimed structure for both of the separately claimed co-crosslinking monomeric unit and homo-crosslinking monomeric unit.

Claim 2 of the instant invention recites a substituted or unsubstituted aliphatic group for R_1 and R_2 , thus provides for hydroxyl functionality on R_1 and aldehyde functionality on R_2 . Page 8, lines 7-12 of the instant specification provides further support for the structure claimed in the '176 Patent by stating that, if R_1 is substituted, the substituents(s) will preferably include an electron withdrawing functionality at the

Art Unit: 1731

alpha-methylene position relative to the aldehyde moiety, and that a suitable electron withdrawing functionality is a hydroxyl group. The instant invention claims units that have either co-crosslinking monomeric or homo-crosslinking monomeric functionality but provides for units that have both functionalities and that can have the same structure. If both kinds of units can have the same structure, then the polymer of the '176 Patent is an embodiment of the instant invention, thus the instant invention is anticipated.

Rejections Under 35 USC §103(a)

Applicants arguments regarding the rejections under 35 USC §103(a) are similar to those given above and the response is the same as that given above.

New Claims

Rejections for the new claims are expressed above. Applicants also argue that the monomeric unit comprising the free amide in the '176 Patent is not capable of forming an unstable, covalent bond with an electrophilic moiety.

The amide moieties are not involved in the formation of unstable bonds. As disclosed on pages 4 and 5 of the instant specification, the unstable bonds of a temporary wet strength resin are hemi-acetal bonds formed between a hydroxyl moiety and an aldehyde moiety whereas a stable amidol bond is formed between an amide moiety and an aldehyde moiety. Also, as stated in the rejection of the new claims, Bjorquist et al discloses a polymer that comprises a cationic unit, and a unit having co-

Art Unit: 1731

crosslinking and homo-crosslinking functionality. Bjorquist et al also teaches that hemiacetal bonds are formed between hydroxyl groups of cellulose and aldehyde functionality of the polymer and that the hemiacetal bonds have a fast rate of decay (are unstable) in water. Bjorquist et al further teaches that amidol bonds are formed between amide groups of one resin polymer and aldehyde groups of another (col 4, lines 26-50).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Art Unit: 1731

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Cordray whose telephone number is 571-272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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